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(54) Rotary cutterblock and method for its manufacture.

(57) A rotary cutterblock for woodworking machinery has a body made up of a row of discs (10) of different diameters. The disc diameters are chosen to approximate, as far as possible, the profile of a timber moulding to be formed, and discs can be selected from a stock of standard sizes. The use of spacers (22) between adjacent discs enables the mass to be kept to a minimum. The cutterblock is quiet in use, especially when blades clamped in successive discs are staggered around the circumference of the cutterblock. A preferred method of manufacture of such a cutterblock having staggered blades comprisises initially mounting the discs (10) on a mounting shaft with the blades (14) in axial-alignment for grinding purposes, and then removing the discs (10) from the mounting shaft and reassembling them in the same sequence but angularly offset one from another.

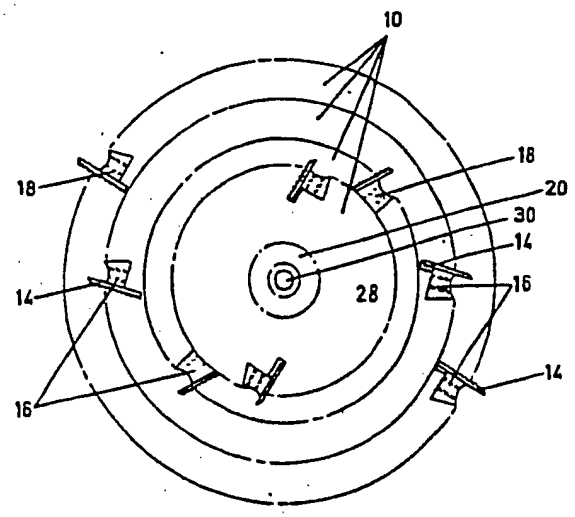

FIG. 3

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Croydon Printing Company Ltd.

TITLE:

Rotary Cutterblock and Method for its Manufacture

DESCRIPTION"

This invention relates to a rotary cutterblock for woodworking machinery, and particularly for moulding machines which produce, in a single passage of timber through the machine, a constant profile longitudinally of the timber.

Rotary cutterblocks are known in which knives, or blades, are bolted or wedged onto a rotary block of constant section. Where the blades are required to cut deeper into the timber they extend further from the block. Also known are solid profile cutters in which the cutting edges are integral with the body of the block, the whole being formed to the desired profile to be cut into the timber. Both these rotary cutterblocks are noisy in operation, however, and it is necessary to provide the machines with acoustic hoods or to provide the users with ear protectors to reduce the risk of damage to the hearing of operators and other workpeople in the vicinity.

The noise level of such known machines has been reduced by the use of spiral knives, but the resulting cutterblocks are expensive to manufacture and still have an unacceptably high noise level.

Our studies have shown that the noise level can be reduced substantially by making the cutterblock itself follow generally the profile to be cut, so that a small

and generally constant length of knife extends from the cutterblock to the timber along the axis of the block. However this in itself creates problems, as the turning of each individual block on a lathe to machine it to generally the same profile as the desired timber moulding would increase the cost to an unacceptable degree. Also the mass of such a block would be high, as the block diameter would be increased, compared with conventional blocks, over a large part of its axial length.

The invention provides a rotary cutterblock for woodworking machinery, comprising a blade holder body comprising a row of discs of different diameters on a common mounting spindle, each disc having wedged therein knife blades. The knife blades are ground so as to form, together, a cutting edge to provide the desired profile in the timber. The disc diameters should be chosen to reduce, as far as possible, the length of knife blade extending from each disc. Thus in an axial position of the disc where the knife blades are to cut deep into the timber a larger disc can be used, thereby reducing the amount of unsupported blade in that zone extending from the blade holder body to the workpiece.

If the discs are in axial abutment, the mass of the resulting cutterblock is large. It has been found that the mass can be reduced substantially, and the advantages of quieter running maintained, if adjacent discs of the body of the cutterblock are separated by

spacer discs of smaller diameter, with the knife blades wedged in the discs being of an axial length sufficient to span the spacing between the discs.

If each knife blade extends axially of the cutterblock and all of the blades are aligned to cut the timber at the same time, certain noise disadvantages of a conventional straight bladed cutterblock are inherent. However the noise level of operation can very readily be improved in a cutterblock according to this invention by rotating each disc relative to the others so that the knife blades are staggered around the circumference of the cutterblock. The noise advantages of a spiral bladed cutterblock are then obtained, without the attendant disadvantages of manufacturing and grinding costs. If desired the discs may first be assembled with the blades in alignment for grinding purposes. After the desired profile has been ground across the line of blades, the discs may then be rotated, one relative to the other, to provide the staggered blade disposition referred to above.

The invention is particularly suited to the use of tungsten carbide blades, as each blade is of a short axial length relative to the total length of the cutterblock, and therefore of a size that can readily be produced from tungsten carbide. Other blade materials can be used, however, and the use of high speed steel is generally very satisfactory.

The possibility of lines being produced on the finished surface of the timber is eliminated by staggering the blades in the direction of the rotational axis and also by choosing joint lines at suitable positions across the moulding.

According to the invention it is possible to assemble, from a stock of standard size discs, an array of discs which follows the general contour of the moulding to be produced. Identical knife blades can then be mounted in the discs, and ground to the actual profile of the desired moulding. Grinding is advantageously carried out on a Wadkin Autoform (Trade Mark) grinding machine which uses a template and follower to produce the final profile. Grinding may most easily be carried out with the blades in a single line, but is also possible when the blades are staggered.

Each disc may carry two or more knife blades, with the blades evenly spaced around the periphery to provide a balanced cutterblock.

This invention is illustrated by the drawings, of which:

Figure 1 is a side elevation of a disc of a cutterblock according to this invention;

Figure 2 is a front elevation of the assembled cutterblock, showing also the section of timber cill moulding which it is intended should be produced; and

Figure 3 is a side elevation of the cutterblock of Figure 2.

In the drawings, Figure 1 shows a disc 10 for use in the assembly of the cutterblock of Figures 2 and 3. It has two diametrically opposite housings 12 each of which is shaped to receive a knife blade 14 and a holding wedge 16 as shown in Figure 3. In use the wedges 16 are forced radially outwardly of their housings 12 by means of Allen screws 18 as indicated in Figure 3. A rear face of each knife blade 14 is serrated longitudinally of the cutterblock so as to obtain a secure clamping of the blades in the housings 12 by the wedges 16.

Instead of the Allen screws 18 forcing the wedges 16 radially outwardly of their housings 12, the means for locking the wedges in their housings may be screws acting between the wedges 16 and the sides of the housings 12 remote from the knife blades 14. Such screws have the effect of jacking the wedges 16 off the sides of the housings against the knife blades 14. This means for locking the wedges in their housings is not illustrated as it is a well known and sometimes preferred method of blade mounting in rotary cutterblocks.

To assemble a number of discs 10 into a cutterblock according to this invention, the discs are threaded onto a mounting shaft 20 (Figure 3), with smaller diameter spacer

discs 22 separating adjacent discs 10. As they are threaded onto the mounting shaft 20, the different discs 10 are chosen from a stock of discs of different diameters so that each disc approaches as nearly as possible the profile of the wood moulding W (Figure 2) which is intended to be formed. A key slot 24 in each of the discs 10 cooperates with a longitudinal key (not shown) on the mounting shaft 20 to keep the housings 12 on the different discs in precise axial alignment as the discs are threaded onto the shaft. Blade elements 14 are then mounted in the housings 12 using the wedges 16 and Allen screws 18 as described above, with the edges of adjacent blades in close abutment one with another. The profile of the desired wood moulding is then ground across all of the blades 14.

Finally the individual discs 10, with the ground blades 14 securely clamped in position thereon, are unthreaded from the mounting shaft 20 and rotated through an angle α before re-threading. The angle α varies with the different diameters of discs 10, and is established by means of a second key slot 26 in each disc. In consequence, the blades 14 in the final assembled cutterblock are angularly offset one from the other as shown in Figure 3.

The assembled cutterblock can be mounted on the

spindle of a woodwork moulding machine by means of a taper mounting of the machine which cooperates with a taper 28 formed in an axial bore 30 of the mounting shaft 20. Other known methods of mounting are of course possible. For example the mounting shaft 20 may have an axial bore therethrough for receiving a cylindrical machine spindle. The mounting method is not however material to this invention and other mounting methods are not illustrated.

In use, the length of unsupported blade 10 extending from the cutterblock is small compared with prior art high profile cutterblocks. This reduces considerably the noise of operation. The noise is reduced further by staggering the individual blades 14 as shown in Figure 3, thereby ensuring that no blade the full axial width of the cutterblock strikes the timber at any one instant.

Individual blades can be replaced one at a time if they become damaged but it is then necessary to re-grind the assembly to produce the desired blade profile again. The blades may be sharpened by grinding or may be reduced to a common profile by the process of jointing.

Claims

1. A rotary cutterblock for woodworking machinery, comprising blade means wedged into a blade holder body and ground to a desired profile for cutting a wood moulding, characterized in that the blade holder body comprises a row of discs (10) of different diameters, mounted on a common spindle (20) and each having wedged therein at least one blade element (14) so that the blade elements (14) together span the entire width of the cutterblock and form the blade means.

2. A rotary cutterblock according to claim 1, wherein adjacent discs (10) on the spindle (20) are separated by spacer discs (22) of smaller diameter, and the blade elements (14) wedged in the discs (10) are of an axial length sufficient to span the spacing between the discs.

3. A rotary cutterblock according to claim 1 or claim 2, wherein the blade elements (14) are angularly spaced around the cutterblock.

4. A rotary cutterblock according to claim 3, wherein the discs (10) are keyed to the spindle (20).

5. A rotary cutterblock according to claim 4, wherein the discs (10) are provided with two key slots (24,26) enabling them to be keyed to the spindle (20) with their blade elements (14) in linear alignment or angularly spaced.

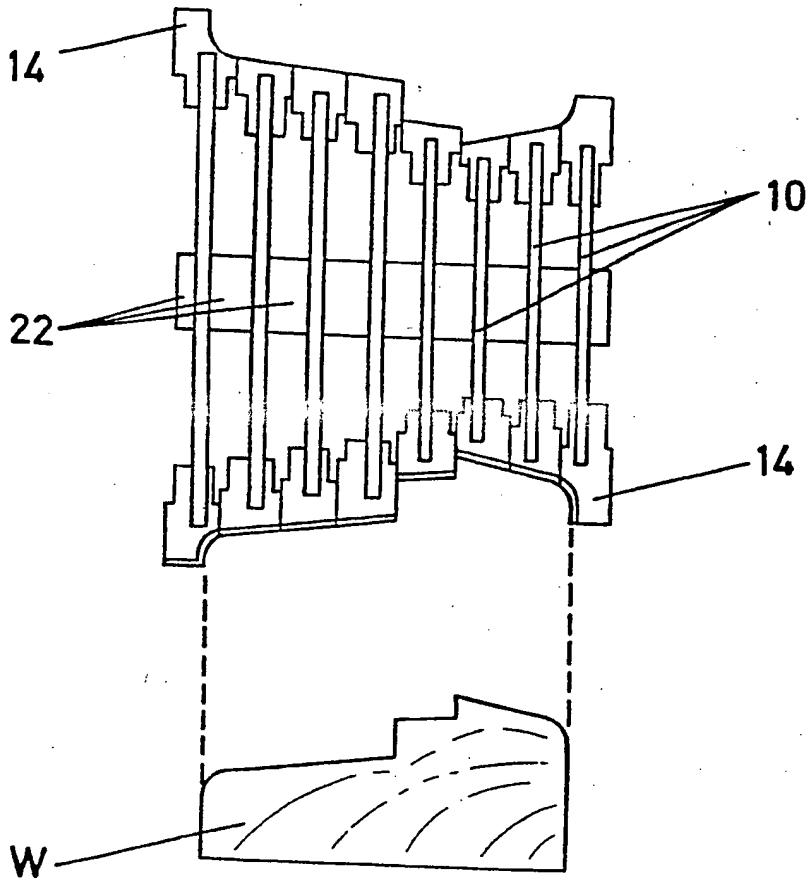

FIG. 2

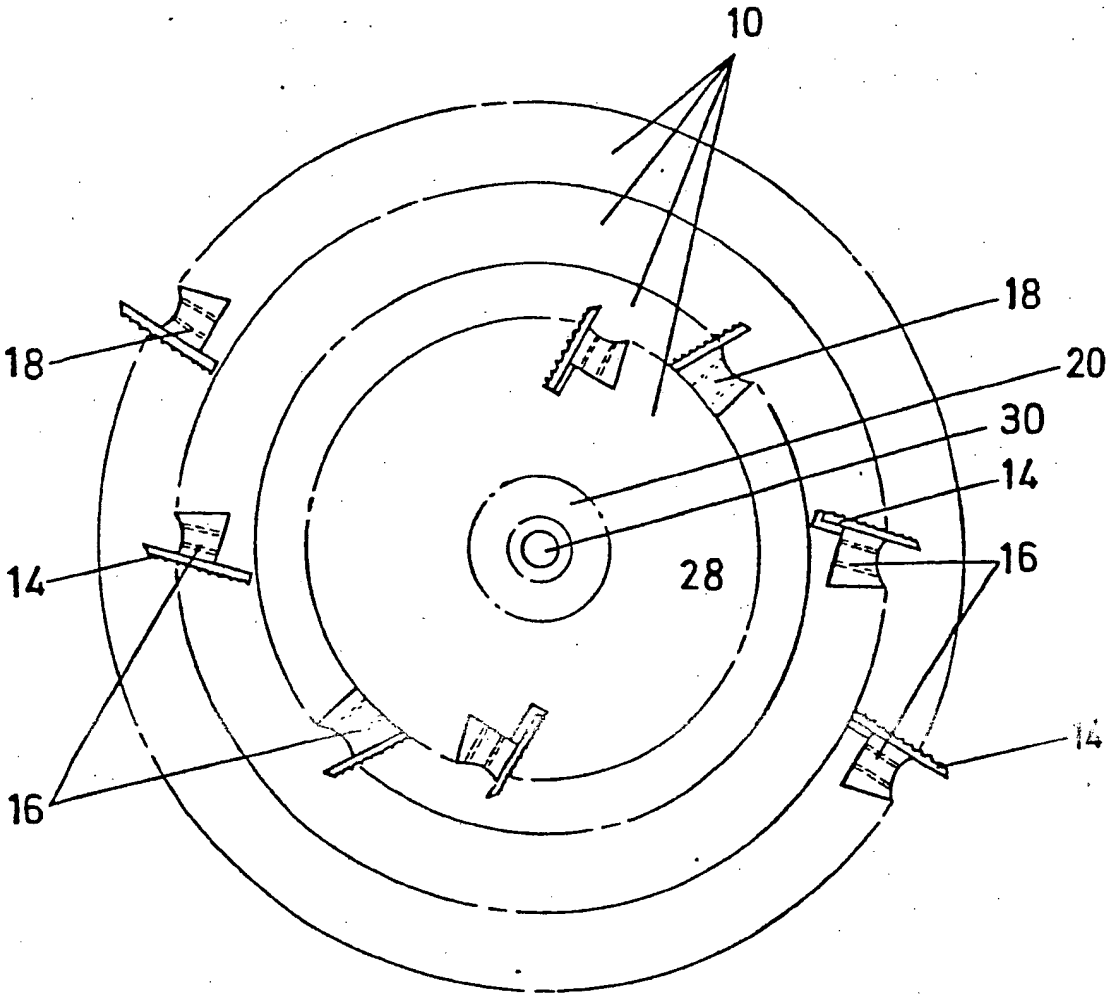

FIG. 3

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.³)
	US - A - 3 237 275 (MIDDLETON) Column 3, line 51 - column 4, line 63; figures * --	1,3,6, 7	B 27 G 13/12
	BE - A - 387 408 (DE BELDER) * Page 1, line 1 - page 2, line 6; figures * --	1,6,7	
	US - A - 3 986 543 (SLAYTON) * Column 3, line 53 - column 4, line 10; figures * --	1,3,6, 7	TECHNICAL FIELDS SEARCHED (Int.Cl.³)
	FR - A - 812 964 (PRAT) * Page 1, line 51 - page 2, line 28; figures * --	1-3,6, 7	B 27 G
	US - A - 1 535 673 (LOEWER) * Page 1, lines 51-105; figures * --	1,6,7	
	FR - E - 59 599 (GOSRE) * Page 1, right-hand column, lines 3-10; figures * ----	1,6,7	

CATEGORY OF CITED DOCUMENTS

- X: particularly relevant
- A: technological background
- O: non-written disclosure
- P: intermediate document
- T: theory or principle underlying the invention
- E: conflicting application
- D: document cited in the application
- L: citation for other reasons
- &: member of the same patent family, corresponding document

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	03-09-1979	HORVATH

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